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ABSTRACT

The attitudes of faculty members toward international students were studied through comparative case studies of four academic departments at three professional schools of a Midwestern university. The focus was on graduate students because most international students at a 4-year institution study at the graduate level. In all 54 faculty members in the public health, architecture, mechanical engineering, and materials science and engineering departments were interviewed. Faculty members displayed a range of awareness of any problems international graduate students might have. Some observed few differences between domestic and international students, but most indicated an awareness of academic and personal issues such students face. Most recognized difficulties with English as a major hurdle for these students, and more faculty members were aware of language problems than any other issue. Many acknowledged the difficulties in cultural adjustment. Faculty members tended to identify the same areas students in other studies had indicated as obstacles in their studies in the United States. Some differences among departments are noted. (Contains 30 references.) (SLD)

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Running head: FACULTY PERCEPTIONS OF GRADUATE INTERNATIONALS

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Faculty Perceptions of Graduate International Students

The Benefits and Challenges

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Abstract

Graduate international students benefit faculty by helping them to establish international ties and by bringing diverse perspectives to their departments. Integrating domestic and international students and effectively meeting these students' unique academic needs challenged a number of those interviewed for this study.

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Faculty Perceptions of Graduate International Students: The Benefits and Challenges

International students have a long history in this country--the first came from overseas in 1784 and by 1946 15,000 were studying here (Jenkins, 1983). After World War II their numbers skyrocketed. By 1954 there were 34,000, by 1974 there were 155,000, and in 1998, 491,000 were studying in this country (Davis, 1999). Rapid economic development in many countries, particularly in Asia where there is strong demand for science, engineering, and graduate training, accounts for much of the recent growth. (Davis, 1995; Il'Chenko, 1993; Lulat & Altbach, 1985). Because many countries do not have an adequate higher education infrastructure to support their growing educational needs, they are outsourcing this service. A second reason for recent growth is the simple fact that foreign governments and individual families are increasingly able to support individuals who want to study overseas (Agarwal & Winkler, 1985).

Today over half of all international students in the United States come from Asia, 15% come from Europe, 11% come from Latin America, and approximately 6% each come from Africa, the Middle East, and North America (Davis, 1999). Just as the sending patterns are not evenly distributed, neither is the concentration of these students across institutional type. When examined by Carnegie Classification, over 30% study at Research I universities, and Masters I and community colleges combined host another 34%. Therefore, while international students only account for 3.6% of total U.S. higher education enrollment, they are a significant presence at some institutional types, particularly Research I universities where they often account for almost 10% of an institution's enrollment (Davis, 1999).

Although more than 450,000 international students study in this country each year, relatively little is known about faculty members' perceptions of them. Do they perceive that significant differences exist between international and domestic students in terms of academic

preparation, goals, or performance? Do these students represent unique benefits or challenges for their departments? This study set out to understand more about faculty members' level of awareness and attitudes about international students through four departmental case studies at a Research I university in the Midwest. A review of the scant literature published on this topic since 1980 sets the context for the present study.

Barber and Morgan surveyed engineering faculty about these issues in both 1984 and 1988. In the first study, they asked faculty whether they believed they had to lower their standards to accommodate internationals in the classroom. Eighty-seven percent replied that they had the same academic expectations for internationals as they did for Americans and 97% used the same grading standards for both groups.

In the second study, a majority of the 943 engineering faculty surveyed thought American students designed equipment better, ran experiments better, and wrote better (Barber & Morgan, 1988). On the other hand, they generally perceived international students to be better at conducting theoretically sophisticated research. Eighty-three percent of foreign-born faculty said international students work harder than American students, compared to 58% of American faculty. One third of all faculty believed internationals brought fresh perspectives to research problems and one quarter reported internationals had provided new ideas for future research. Overall, more than 90% of foreign-born faculty members believed international students were important or very important to their research in the past few years, while almost 75% of American faculty agreed with that statement.

As international student numbers grew by 35% in the 1980s, however, some members of the higher education community became uneasy. A study by Goodwin and Nacht in 1983 involving interviews with faculty at 18 diverse institutions explored this apprehension.

According to the authors, although many faculty members recognized their department's dependence upon international students as teaching and research assistants, as well as consumers of educational services, "there was no joy in the circumstance, and these faculty often yearned for the 're-Americanization' of their programs. Some of these faculty seemed to feel shame at their dependence on foreign students" (p. 9).

These students' impact on departments' climates and in particular departments' increasing reliance on international teaching assistants (ITAs) likely contributed to these negative attitudes. According to Fisher, "The late 1940s and the early 1950s saw the establishment of the TA as a permanent member of the undergraduate instruction team at American research-oriented universities . . . The 1980s seem to be the decade of the new TA challenge: the foreign or non-native speaking TA" (1985, p. 63). As domestic students complained about ITA's poor pronunciation of English words, their inability to comprehend students' questions, and their lack of organization when presenting materials (Bailey, 1984; Fisher, 1985; Jacobs & Friedman, 1988), faculty's perceptions were likely influenced by this new tension.

Other publications regarding faculty members' perceptions of international students fall into the category of opinion pieces that lack empirical research to support them. Several have observed that faculty members do not adequately value or understand this population (Cooper, 1983; Kaplan, 1987; Light, 1993; Selvadurai, 1992). These authors argue that international students not only fill enrollment needs, particularly at the graduate level, but also play a critical role by later filling faculty openings in certain fields. Further, their presence enhances the learning environment for American students. Nevertheless, these authors believe faculty members tend to ignore or undervalue the significant impact of internationals' presence and their need for these students by refusing to take into account their special needs and priorities.

Research Problem and Methodology

Because so little research exists on this topic, and most of what does exist is more than a decade old now, this study was designed to renew exploration of faculty members' attitudes toward international students. The researcher sought to understand in more depth what faculty observe about these students and how they characterize their presence.

Comparative case studies of four academic departments within three professional schools at a top mid-western research university were conducted. A qualitative approach was used because this is an area of only recent research and most previous studies were conducted without any theoretical foundation. Case studies were conducted to gain a more holistic understanding of the departments, the natural context within which they operated, and the process they went through in formulating perceptions of international students. The specific focus was on faculty members' perceptions of graduate students because a majority of internationals at four-year institutions study at the graduate level (Davis, 1999) and faculty generally spend far more time with these students than with undergraduates as they work with them on research projects and teach them in smaller classes.

Issue processing theory guided the research. Using a cognitive approach, it suggests that people obtain environmental information about an issue and then attach their own labels or categories in an effort to make sense of the circumstances surrounding them. Based on their interpretation of the environment, individuals and organizations then formulate and enact a response to the issue (Weick & Daft, 1983). What faculty members individually notice about international students, how they in turn characterize this population, and how they and departments eventually respond to them was explored through this study. This paper discusses the findings regarding the noticing and characterizing aspects of the process, while a forthcoming

paper will explore how faculty members and departments actually respond to international students.

The public health, architecture, mechanical engineering, and materials science and engineering departments selected for the study each had at least 10% graduate international student enrollment and were organized in similar ways. In all, 54 people were interviewed, including deans and associate deans (6), department chairs (4), professors (21), departmental staff members (10), student leaders (4), and professionals across the campus who regularly work with international students (9). Documents such as enrollment reports, strategic plans, and program reviews were also incorporated into the case studies.

Initial data analysis involved studying the interview transcripts and case study documents to look for prominent themes. The author coded these by hand and then created a list of the codes. Due to the exploratory nature of this study, there was a hesitancy to begin by using pre-determined codes and matrices, so this more structured approach became the second stage of the analysis (Miles & Huberman, 1984). By analyzing the coded and organized data, relationships became evident (Creswell, 1994, Eisenhardt, 1989, Lincoln & Guba, 1985). Once a draft was completed which described and analyzed each of the four cases, a person from each unit reviewed the findings and provided feedback regarding the accuracy of the descriptions. In each case, no significant errors were found.

Limitations

Limitations exist in this study, although they are primarily characteristics inherent to qualitative research. First, because data were only collected from four departments at one research university, the findings may not be generalizable to other settings. Second, throughout most of this paper, international students are treated as if they were a homogeneous group and

differences among them are only rarely considered. This approach is taken because the four case study departments enrolled students from approximately 20 countries, so addressing differences among nationalities of students would have led to overwhelming detail. Also, the vast majority of international students in the cases were Asian and faculty seemed to respond to interview questions with these students in mind (although significant cultural differences certainly exist among Asian countries as well).

According to the issue processing theory, the guiding framework for this research, what faculty members notice about international students and how they characterize them largely occurs at an individual rather than organizational level. For this reason, descriptions regarding each of the four cases are brief, including basic demographics and a sketch of each unit's level of commitment to internationalization generally.

Overview of the Four Cases

Architecture

The architecture department was the first unit studied. They enrolled 397 students in the fall of 1997, over half of whom were studying at the graduate level. Twenty-six percent of these graduate students were international and, as is the case in the other three departments, a majority of them were from Asian countries. In addition, more than one-quarter of the faculty was born outside the United States.

Because the architecture profession is global, today's most sought after graduates are those who have received an education that transcends U.S. borders and who have gained experience working on international projects. In fact, both employers and the architectural accreditation board have consistently encouraged this department to internationalize. The dean and the chair, as well as many of the faculty, agreed with them and organizational leaders have

taken the initiative in recent years to pursue formal ties with overseas universities, corporations, and governments, to sponsor student and faculty exchanges, and to place a foreign-born individual on their alumni board.

Public Health

The public health department included in this study offers only graduate degrees. Of the 239 students enrolled during Fall 1997, 18% were classified as foreign, the lowest proportion of the four cases. Eight of the 26 professors were also foreign-born.

Research conducted in the department includes both highly technical, as well as policy-related work. Here, the clear mandate to internationalize does not exist as it does in Architecture. Leaders at the school and department level recognize the role the school could play in helping to address public health issues in other countries. Nevertheless, they have not developed a clear strategy for doing so because the costs to this department and individual faculty members could be potentially quite high.

Funding can be scarce for work in developing countries and it often requires far more applied than pure research, which many in U.S. academic circles consider less prestigious. Also, the perception exists that foreign journals are generally of a lower quality than American journals, which keeps many tied to topics that are publishable in the latter. For this department, then, there is no clear path that leads to continued legitimacy and increased prestige within the United States, while simultaneously allowing for pursuit of an expanded international focus.

Mechanical Engineering

The mechanical engineering department is unique in several ways from the other three cases. First, it is the largest unit, enrolling 961 students in the fall of 1997. Second, of the 378 graduate students, 59% were international, by far the highest proportion of the four cases. Third,

54% of the faculty was foreign-born, nearly twice as many as in the other departments, which along with the large international student population, helped to make the unit quite cosmopolitan.

Because the United States is the world leader in engineering research and because the curriculum does not have a sociological component, the need to bring in different scholarly or cultural perspectives is certainly less pressing than in the previous two cases. Also, establishing ties with overseas universities and conducting research with foreign faculty, while considered important activities, are not as high a priority as in the architecture department. Instead, the unit's clearly articulated goal is to become the best and most highly ranked department it can be.

Materials Science and Engineering

The second engineering site has in common with the first a strictly technical curriculum and relatively little emphasis on establishing ties with foreign universities and corporations, or other activities that would increase the international focus of the unit. Beyond these similarities, however, lie many differences. To begin with, the materials science and engineering department is much smaller--only 170 students--and more cohesive than Mechanical Engineering. Second, of the 87 graduate students, rather than a majority, only 35% were international. Third, a clear majority of the faculty, 15 of the 18, was American-born. Finally, while the department enjoys a Top 10 ranking nationally, it is not as highly ranked vis-à-vis peer departments as is the previous case.

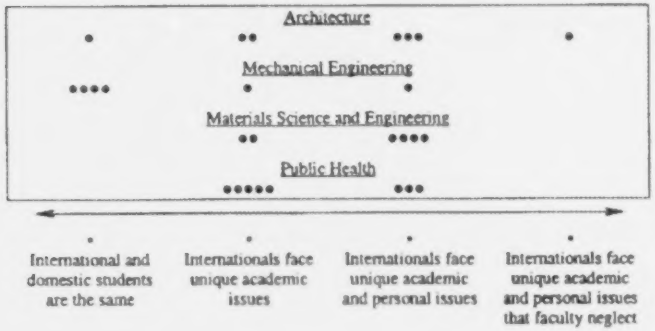
This unit has experienced significant pressure from outside groups to keep international enrollment numbers as low as possible without sacrificing overall student quality. Employers have pushed for more American graduates when soliciting applications from the department and federal funding agencies have repeatedly voiced their preference for funding American students with research contracts. (All graduate students in this department receive full funding.) Finally,

some American applicants have expressed a hesitancy to enroll in the department, fearing that they would feel like a minority because so many internationals were enrolled.

Noticing Unique Attributes of International Students

A Range of Perceptions

Faculty members from the four cases varied in terms of what they noticed about international students. During the interviews, some said they did not regularly consider unique issues that these students might deal with, while others quickly articulated both personal and academic issues that they believed international students face as they study within a prestigious American university. Because of this range of awareness, a continuum is useful for displaying the various perspectives identified through analysis of the interview data. (See Figure 1).


Architecture
Mechanical Engineering
Materials Science and Engineering
Public Health
International and domestic students are the same
Internationals face unique academic issues
Internationals face unique academic and personal issues
Internationals face unique academic and personal issues that faculty neglect

• = individual faculty member's perception of international students

Figure 1. Continuum of faculty perceptions regarding international students

Each asterisk characterizes what one of the five interviewed faculty members, or the chair, noticed about international students. Numbers vary from department to department

because school administrators in architecture and public health were also faculty members. Reading across shows how a department's members fell along the continuum. Reading down conveys the total number of respondents in each category. The distribution of the 27 perspectives roughly follows the normal curve, with few respondents expressing the views located at either end of the continuum. In addition to differences in what faculty observe, the continuum also reflects variance in terms of whether one believes the issues are cause for concern. The further to the right one's perspective is along the continuum, the stronger the feeling that their department has a responsibility to try to accommodate these students.

At the left end of the spectrum are those who observe very few differences between international and domestic students. As a mechanical engineering professor explained, "We really don't think of our graduate students as domestic and international. Once they are here, they are all people we deal with." At the other end of the spectrum, a faculty member from architecture strongly believed international students arrive with a unique set of needs and concerns, which deserve far more departmental attention than they now receive.

> There's very little effort given to understanding them and working to adapt the program to meet their needs . . . We don't try to learn from them – what's driving them to become architects, what it means for them to be an architect. We see them as needing to have their framework enhanced, reshaped when they come to school.

The first of two groups in the middle of the continuum was aware of a few academic issues, such as students' struggle to comprehend classroom lectures, while the second group observed both personal and academic challenges that international students face. As one professor from this second group observed, "They are much more complex . . . For some it's

financial problems. Students are unaware of the costs of living here. Depending upon how they're able to relate to their peers, a sense of alienation can exist." (architecture)

Several factors influenced whether and to what extent faculty were aware of issues related to international students. Within the case studies, examples were found of an accrediting agency, school administrators, employers, and American students pushing international student issues to the forefront of departmental discussions. However, most significant was the awareness faculty members gained simply by working closely with these students, as well as for some, the sensitivity that came from having lived in a foreign culture themselves.

> Foreign students have said to me, "I understand you." I know it's because I learned this [from living overseas]. One of the greatest things I ever did was to spend a year in a country where the people prefer not to speak English. They prefer to speak their native tongue. That helped me communicate back here substantially. (materials science)

In fact, it was individual faculty members, rather than the chair or an outside group, who most often brought issues, such as curricular change, forward in departmental meetings and informal conversations. This supports the theoretical premise that noticing is an individual activity, which eventually influences how an entire organization interprets and responds to an issue. It also suggests that what is noticed depends more on internal rather than external factors.

The Issues Observed

Again, most faculty members interviewed for this study indicated an awareness of academic and/or personal issues that international students face. Table 1 displays the specific issues that they described and the proportion aware of them. Faculty mentioned language difficulties more often than any other problem.

Table 1

What Faculty Most Often Noticed about International Students

Department	Academic Challenges	Personal Challenges
Architecture	Achieving unique academic goals (4 of 7)	Cultural adjustment (3 of 7)
	Functioning in English (5 of 7)	Financial difficulties (2 of 7)
		Segregation (3 of 7)
Mechanical Eng.	Functioning in English (3 of 6)	Cultural adjustment (1 of 6)
		Segregation (1 of 6)
Materials Science & Eng.	Functioning in English (3 of 6)	Cultural adjustment (1 of 6)
		Segregation (6 of 6)
Public Health	Achieving unique academic goals (1 of 8)	Cultural adjustment (3 of 8)
		Financial difficulties (2 of 8)
	Functioning in English (3 of 8)	

> Communicating between professors and students, between the students themselves [is different]. . . Lots of our foreign students, even though they are very, very smart people, have considerable difficulty writing in English. That is an effort they have to go through, on top of everything else. (mechanical engineering)

Architecture and public health faculty also observed that some students might not feel they had achieved all of their academic goals when they graduated from the program. Students from these two departments usually return home to work, and because components of the curricula are context specific rather than universal (e.g., public health policy, architectural design), they may not be able to easily adapt all that they have learned to their foreign work environment.

Third, members of three of the four units noted a marked segregation of domestic and international students, caused in part by language difficulties.

> You meet other students from Thailand, so there's this great bond that pulls you together because you're far away. I don't think there's as much mixing as there could be. I think it's just something that you can't engineer. You can't structure that. (architecture)

The low percentage of international students enrolled in Public Health (18%) may explain why no faculty member mentioned segregation as an issue for them. International students may be able to integrate more easily there because there are fewer like themselves with whom they can cluster.

Fourth, faculty from each department observed how difficult it can be for internationals to adjust to the American culture. For example, a professor from public health volunteered, "They're shocked by the informality of the student-teacher relationship. In Korea, the relationship is extraordinarily hierarchical, formal, lots of bowing, and here, this informality is astounding to them." This adjustment can be made even more difficult if students do not have the funds to support themselves, as some in architecture and public health pointed out. In these two units, internationals are far more likely to finance their education themselves, compared to the engineering departments.

More faculty members were aware of an issue that directly affects them – students' difficulty communicating in English – than any other issue. However, a significant number were also quite sensitive to less obvious problems international students may face such as integration with American students, financial difficulties, and adjusting to what is often a very different academic and social environment than that to which they are accustomed.

How do these faculty observations compare with what international students report to be their greatest challenges when studying in the United States? Financial concerns are among the most commonly mentioned stressors in surveys of graduate and undergraduate international students (Arthur, 1997; Bontrager, Birch, & Kracht, 1990; Deressa & Beaver, 1988). Academic concerns, including studying efficiently, earning satisfactory grades, understanding class lectures, questioning the relevance of the course work to their home country and their future career, and adjusting to a different educational system, are also commonly cited in surveys (Chen, 1999; Deressa & Beaver, 1988; Parr, Bradley, and Bingi, 1992).

Personal issues, such as finding adequate housing, adjusting to a different climate, and understanding the relationship norms of American society, frequently cause concern for these students (Althen, 1990; Sarkodie-Mensah, 1998). Finally, several studies have found that international students are often disappointed with their low level of social contact with Americans and that many feel isolated on American campuses (Chen, 1999; Owie, 1982; Penn & Durham, 1978).

Faculty interviewed for this study, then, generally identified the same issues that international students themselves report as problematic to their U. S. adjustment. The most significant difference is many faculty members' apparent lack of awareness that internationals would often prefer to integrate more with the Americans in their departments. While faculty observe the segregation, some incorrectly attribute it solely to a desire to "be with one's own." Recommendations for addressing this are discussed in the implications section.

Differences Among International Students

Beyond issues that faculty noticed about the overall population of international students, did they also differentiate among these students during the interviews? To a certain extent, yes.

While no faculty member commented on differences they had observed between males and females, a small number did note that significant variety exists among international students based on their country of origin, which makes generalizing difficult in some instances.

The majority of students in each case were from Asian countries and it is primarily to these students that faculty referred when they described problems related to language difficulties and segregation. Students from Europe often arrive with a better command of English and develop relationships with Americans more easily, several pointed out. (Australians, Canadians, Africans, Latin Americans, and Middle Easterners represented very few students in the case study departments, which explains in part why no respondent commented specifically upon what they had noticed about them.) On the other hand, international students of all types face challenges such as adjusting culturally and managing financially. Therefore, it should not be assumed that every issue would be most properly dealt with by dividing the students into sub-categories.

Characterizing Graduate International Students

The process of noticing international students involves considering the students' perspective. What are their needs and weaknesses? What obstacles do they face? The second phase of the issue processing model involves evaluating how this population fits within the department and how the department is shaped by them. During this phase faculty ask, what is their value to our organization? What problems must we deal with because international students are enrolled? Table 2 provides a summary of the four units' perceptions of the contributions and challenges associated with enrolling graduate international students.

Table 2

Perceived Contributions and Challenges of Internationals as an Influence on Interpretation

Contributions	Arch.	Mech. Eng.	Mat. Sci. and Eng.	Public Health
Provide international perspective within the unit	X	X	X	X
Represent highest quality students	X	X	X	X
Fill research assistant vacancies		X	X	
Bring work experience	X			X
Help faculty establish international ties	X			X
Enhance department's international reputation	X			X
Provide American students with a more accurate perception of their life circumstances				X
Challenges				
Integrating international and domestic students	X		X	X
Evaluating/addressing English language problems	X	X	X	X
Avoiding American students' hesitancy to enroll		X	X	
Providing students with adequate funding		X	X	X
Meeting internationals' unique academic needs	X			X
Helping students acquire prestigious U.S. positions		X	X	
Managing some faculty's preference for Americans			X	
Interpretation	Oppor-tunity	Non-Issue	Threat	Oppor-tunity

The Benefits

Considering the positive aspects of their presence first, faculty noted a number of important contributions that internationals make. Faculty in every department commented that these students provide an important international perspective within the unit. Engineering faculty emphasized how international students' presence prepares students for the "real world" of work where they will interact with people from many cultures.

> I think we want students who are in the process of mastering English. We want students who have diverse looks. We want students who pray on a carpet in their offices. I think we just want that because if our graduates are as successful as we hope most of them will be, they are going to have to deal with the global. (mechanical engineering)

In addition to noting how internationals enrich the overall culture, many public health and architecture faculty members also commented on these students' valuable contributions to class discussions and how they added to domestic students' overall learning experiences.

> If they come into a particular course and they look at how things are done in Europe, or how they're done in Africa or Asia, that enriches the class if there is a discussion, even if the class is not explicitly oriented toward comparative viewpoints. (architecture)

The high academic quality of international students is a second benefit that members from every department noted. A College of Engineering administrator described them as "the brightest of the bright" and a public health professor believes they are able to recruit "the best of the best in an entire country." Mechanical and materials science and engineering faculty both went on to comment about the specific benefit of international students' typically strong mathematical preparation. "I think consciously or not, it really pushes the American students to get up to their level [in math]." (mechanical engineering)

Beyond their academic skills, international students are crucial to the two engineering departments' ability to fill research assistantships. As someone from mechanical engineering commented, "They keep our program going. You've got to have graduate students to have research and if we didn't have the foreign students, we'd be in bad shape." The public health and architecture units have fewer research assistantships, so they have far less difficulty filling them with quality students. Instead, in these units, faculty value the work experience and more developed skills that international students often bring, because they are far more likely than domestic students to have worked for a few years before pursuing graduate studies. As one architecture professor described, "Many of the Southeast Asian students can draw like anything. Some can draw American students' pants off."

Architecture and public health faculty went on to articulate other benefits of enrolling internationals that no one from the two engineering departments mentioned. First, because of ties to their home country, students and especially alumni can provide valuable connections for research collaborations, as well as introductions to high-level academic, corporate, and governmental leaders when departments wish to establish formal relationships with overseas organizations. Two examples from public health were highlighted during the interviews. One professor commented, "When I went on sabbatical, one of my Finnish students helped arrange some of the sponsorship for me." Another described, "Two international students from Venezuela met here and married. One had many high connections. For five years in a row, I went down there assisting in environmental problems with lakes there." These ties are important to the two units today and leaders believe they will become even more valuable in the years to come as the fields become increasingly internationalized.

Second, simply by their presence, architecture and public health faculty members believe internationals enhance the reputation of their departments. According to a School of Architecture administrator, "If we didn't have an international program, we would be ranked much lower."

Finally, more than one faculty member in the public health department mentioned the important influence internationals can have on domestic students' and faculty members' perceptions of their life circumstances.

> I think it's a little understood truth in the United States how good we all have it. That statement, in itself, is an understatement. Americans are whiners. We complain about everything. It would cure our complaining to live in a third world country or to live as most of the people in the world do today. . . . The profound difference between what we have and what they have is something that you come to appreciate when you work with international students and when you spend time in other countries. You become grateful to an extent you never thought you could. I think that there's value in that for individuals.

The Challenges

In addition to these benefits that faculty have observed, they also acknowledged that certain challenges are inherent to enrolling international students. Two of the most significant have already been mentioned in terms of what faculty members observed about internationals. First, many students' struggle to communicate effectively in English can require professors to spend extra time directing them in the laboratory or design studio. It can also affect students' overall performance in courses, especially during their early months of graduate study.

In Architecture in particular, language skills are essential, as more than one professor pointed out, because students are required to make presentations, work in groups, and interact regularly with faculty in the studio.

> A lot of the design studio instructors primarily instruct by going from desk to desk, talking to each student. . . In small group situations where they're discussing design ideas and approaches, design theories, instructors would have the feeling that there was an "OK, I get it" and then they come back the next studio time and the progress that has happened was not at all indicative of a digesting of a previous conversation. It would be like divergent messages.

Beyond the extra time and energy that communication difficulties can require, faculty members were also challenged by the dilemma of how to more effectively evaluate language skills when admitting students. As a public health member commented, "the TOEFL [Test of English as a Foreign Language] scores do not seem to be indicative of whether the students can speak English or not." A materials science and engineering professor was a bit more blunt:

> Demanding more [English language] expertise, it's bogus. What are they, the TOEFL scores? The TOEFL scores on our incoming students are very high. For example, one student I worked with has a very high TOEFL score, but I did not perceive that he was understanding me . . . Are they being prepped for these tests, helped to do very well on these tests, when the actual speaking ability just isn't there?

Faculty members are, however, unsure how better to evaluate incoming students' English language skills.

Language difficulties are certainly related to the other challenge that has already been mentioned--segregation. This can be problematic because research groups may not function as effectively when members do not share what they are learning and do not help each other as they work. Also, if a department becomes "ghettoized," as one materials professor described it, the climate can become uncomfortable for everyone.

What is most interesting to note are the different perceptions about this issue found in the two engineering cases. In the materials science and engineering department, which is relatively small and quite cohesive, this issue is a significant concern and many discussions have taken place about it. As the chair described, "International students self-segregate. They don' t talk with other nationalities...I tell them frequently, 'Domestic students, you reach out to internationals and international students, don' t speak your language in the lab or in class.' "

In mechanical engineering, on the other hand, only one person offered that segregation was a problem. When two others were specifically asked whether international and domestic students interacted, they acknowledged that there was very little mixing, but that faculty were comfortable with this arrangement.

> I wouldn't necessarily say that people see it as a problem. People see a lack of intermingling as a fact. As long as students feel like they're having enough support, then that's OK. We let them find their friends. And a lot of them, especially if they are just coming here from abroad, they want to associate with people from back home.

The unit's large size and the fact that a majority of both faculty and graduate students were foreign-born may help to explain this difference in perceptions.

Another challenge for the materials and mechanical engineering departments is to keep international student numbers low enough that American applicants feel comfortable with the balance. This ratio is apparently different for each prospective student, but if when they visit the department or talk with current students they conclude that international student numbers have risen too high, they may decline admission.

A fourth challenge mentioned by members of three of the departments is trying to provide international students with adequate funding. The architecture department only funds

about 20% of its students, so the faculty there did not mention this issue. The others, however, described a real dilemma they can face if funding on a program the student was working on runs out because they know that these students have no other means of support. Also, because some federal grants specify that only American citizens can work on the project, faculty can find themselves in a bind if their research group primarily consists of students from overseas.

> There are federal agencies that have said in no uncertain terms, you may only take on a U.S. citizen. There are other agencies where the program officers have said, "You ought to have U.S. citizens, or a higher fraction of U.S. citizens." Now part of it makes sense because the student, as part of the work, may have to go within laboratories where clearances are required and the work can't get done by anyone except a U.S. citizen. (materials science)

Fifth, the fact that international students can arrive on campus with unique academic goals is not only something that faculty in the architecture and public health departments observed, but something that they perceive as a challenge to their work with this population.

> There are people that would talk about what kinds of courses do we offer to international students. Do we offer the standard fair or do we offer courses that deal more with international issues? When we talk about international students in faculty meetings, a lot of times that issue has come up. (architecture)

Students' post-college plans can also prove to be a challenge to faculty. Engineering faculty estimated that over half of their graduates remain in the United States after graduating. This in itself is not a challenge, but these alumni usually find industrial positions rather than the more prestigious academic posts that would contribute more significantly to their advisor's reputation.

> Foreign students are more likely, after they graduate, to fall off the earth in the sense that, maybe they'll get an applied job and will be successful, but you'll never hear from them again. They're not out there in the public. So if my goal is to have more of my students be active in the basic research area, I know my chances are much better if I have domestic students. (materials science)

This is not the case for architecture and public health faculty whose graduates usually return home to work, often landing key leadership positions in their country during the course of their careers. For many, particularly in public health, this is not a challenge related to international students, but a wonderful way for them to be involved in training future foreign leaders in these disciplines.

A final challenge articulated by members of the materials science department is dealing with some professors' preference for taking American students into their research group.

> There's a mating dance that goes on every fall where the new students come in and they try to find advisors and advisors try to find students. It's not unusual at the end of this process for there to be a couple of students that still have to worry about placing and more often than not they tend to be Asian students.

Due to international students' language difficulties and domestic and American students' different career paths, this department at times faces a situation where newly enrolled international students cannot find an advisor who will take them into his or her research group, even though the funding is available.

Looking again at Table 2, one can see that overall, members of the architecture and public health departments described more contributions and fewer challenges from this population than did the two engineering departments. This seems to be directly related to the

extent faculty from each department value their presence overall. At a very general level, members of the architecture and public health departments tended to perceive these students as a benefit, whereas faculty in the materials science department often viewed them more as a threat to their reputation and internal functioning. Mechanical engineering, where faculty interviewed usually did not differentiate between domestic and international students, not surprisingly perceived these students as a non-issue.

Disciplinary differences provide a framework for explaining these divergent views. In the purely technical engineering departments, international students were not perceived to contribute to class discussions or group projects in any noteworthy manner because the classes did not include a cultural component and discussions and group activities were not commonplace. In the departments where there is a sociological component, faculty often described class sessions that were far richer because international students were there to offer different perspectives and observations. Also, because most international students in architecture and public health return home to work after graduating, they are able to provide key contacts for members of the department interested in further establishing international ties. In engineering, alumni most often remain in the United States, but beyond that, faculty explained that they did not need to use this population to establish contacts. The scientific research community, through conferences and other means, is already internationalized.

The fact that the architecture and public health departments enrolled relatively low levels of international students, compared to the engineering units, also seemed to influence their more positive perception of this population. Specifically, less than 20% of the students enrolled in the public health department came from overseas, while just over one quarter of the architecture students were foreign. It seems that when an organization has a relatively low percentage of

minority members, professors are less likely to feel overwhelmed by the extra time they can require. Also, external pressure to limit international student enrollment is less likely.

In the engineering departments, on the other hand, faculty members appreciated the exceptional intelligence internationals bring, but at least in the materials science department, they were also quick to point out the accompanying problems, such as poor English language skills and these students' negative influence on the department's climate.

Discussion

This study took place at a top research university where faculty members are often rewarded for their success as researchers rather than as teachers. Therefore, it would not have been too surprising to find that most faculty were quite unconcerned about international student issues or were frustrated that they had to spend extra time with some of them, as a previous study had found (Goodwin & Nacht, 1983). This, however, was not the case.

Instead, many respondents showed an awareness of and interest in international students and the unique challenges they face as they study at an American university. Some expressed concern over personal problems international students face, such as developing friendships with Americans, helping their spouse adjust to a new culture, or supporting themselves financially. Other faculty wanted to assure that these students' unique academic goals were met, so they discussed with their colleagues how to resolve this challenge and solicited feedback from international alumni regarding their satisfaction with the educational program. Many faculty have also kept track of where international students go after graduation, so they know the types of employment opportunities these students typically have in the United States and which nationalities of students are most likely to return home.

Those in mechanical engineering tended to view internationals as less consequential than did those in the other units. Nevertheless, they all spoke of the significant contributions these students make, especially because of their very high intellectual ability and their crucial role in filling enrollment slots left vacant by large numbers of American students who today are opting not to pursue graduate study.

Faculty are not, however, certain how to resolve all of the challenges that international students present. To be sure, some respondents saw no need to expend extra effort addressing international students' unique needs and others believed they were quite successful in educating this population. However, a sizable number were of the opinion that many issues related to these students remain unaddressed or unresolved because no simple or obvious solutions exist. One person in Materials Science observed, "One main issue is communication. If we could do something to improve it, we would be much better off. . . . But we don't really have a good way of doing that." And one from architecture regretfully explained, "I think there is a missing opportunity there [when students do not integrate]. I don't know what type of questions need to be asked, but I think that's a very important thing in terms of the learning experience." Other questions faculty members do not know how to resolve include how to increase the number of countries international students represent and how to get these students more involved in academic student organizations. Recommendations for addressing some of these challenges follow.

Implications

Members in every department studied spoke of the challenges they face when international students cannot function well in English and a number of faculty members commented that many international students' language skills actually deteriorate once they arrive

on campus. Prior to being admitted, applicants may study intensively for English exams, but once they arrive, their focus shifts to their field of study instead. To make matters worse, because people are naturally drawn to others who are like them, some students communicate almost exclusively in their native language outside of class.

To address both language and segregation issues, faculty could make a concerted effort to incorporate more group work into their courses and could purposefully assign students to these groups to increase cultural mixing. More presentations could be required of all students during their years of study and departments could assign office space for new students in such a way as to encourage relationships among individuals from different backgrounds. Finally, departmental student organizations might try to plan more small group activities, rather than those which include the whole department, if they found that students would be more comfortable attending these. International students could be consulted regarding what they would enjoy doing with American students and might even be asked to plan some activities.

The results of this study also demonstrate that faculty could benefit from preparation for a multi-national classroom. They need to be alerted to the variety of services that may be available on campus to help international students--especially any English language and writing courses. It might also be profitable for them to have a mentor within the department who could share what he or she had learned over the years about teaching students from around the world. During the course of the case studies, each of the following questions was addressed by at least one senior faculty member who had developed an answer based on years of experience. How can one encourage internationals to become more involved in class discussions? What are specific steps one can take to determine whether a student has understood the conversation that just took place

about his or her research? What cultural differences should someone anticipate when advising students from Korea, Taiwan, or China?

Young faculty, however, could recall no discussion they had had with others about these issues and senior faculty, again and again, said that they had become more adept at working with international students through trial and error only. Departments who work to make tacit knowledge more formalized may find that faculty (and student) frustration levels decrease substantially.

A final word of caution is in order regarding these suggestions. When communication difficulties arise, it is natural to believe that students' poor English language skills are entirely to blame. However, because language is so intertwined with culture, both professors and students must realize that differences in experiences, behavioral norms, and beliefs often cause misunderstandings as well. Even if all international students were fluent in English, communication would still be strained at times. Therefore, it is important that all parties share in the responsibility of understanding and being understood by others.

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